Notebook, N-10-05-23

This notebook covers the period May-June 1910. All entries are by Edison. The book contains notes regarding the use of storage batteries for automobiles, streetcars, and railroads. The notes pertain to technical and commercial matters, such as vehicle weight, freight capacity, battery endurance, and cost calculations. Among the automobile and railway companies noted are the Anderson Carriage Co., the Erie Railroad, and the Long Island Railroad. On the last page is a list of salesmen who worked for various Edison companies, together with some battery sales figures. The front cover is marked "Storage Battery Notes 1910." The pages are unnumbered. Approximately 20 pages have been used.

Notes, Storage Battery - May 23 1960

Anderson Chaus cost 1600 lbs
A4 40 cells 48 Volts 168 amperes
Weight Battery with Trays 568 lbs
Total cost 2168 lbs -
8064 watt hours output
13360 watt hours input
Efficiency 60% - Mileage of
Vehicle without driver at 100
Watts per ton mile 74.4 miles
Watt input efficiency
179.5 watts per mile

17 plate Exide with trays weigh with
Vehicle 2900 lbs. Volts
10752 watts output at
100 watts per ton mile -
gives 74.1 miles input
14300 watts 193 watts per ton
mile

If 2168 lbs is the proper weight with Edison Battery with 2 persons added making a total of 2468 lbs, then it must be wrong and entirely too weak for the lead battery to give the same mileage.

For the reason that the weight with 2 persons gives a total of 3200 lbs. This is 732 lbs overload or equivalent to 6.8 persons on the vehicle, which is absurd

a photo showing 7 persons on a new chassis with one seat illustrate this absurdity

Anderson 1600 Chassis if it is not to be overloaded but the strains on the chassis to remain the same as the Edison with 40 A4 axles to obtain same wear on vehicle & Rubber tires.

it would be necessary
to use a 7 plate Exide
The weights would then be
the same
But the discharge rate of
the 7 plate Cell will be
50 % too high or above
the normal falling as against
the normal Lead rate for
the Edison — of very great on
grades —
There would be 4032 watts
output if discharged at normal
4 hrs. at 100 watts per
low mile gives a mileage
of 37.2 miles as against
74.4 with Edison

Hallamd get watts at 50% higher
discharge rate —

The wear & tear on vehicle &
tires is to be the same then the
above mileage with the
Lead battery cannot

be increased, If the discharge rate is to be kept normal the speed of the Vehicle would have to be reduced around 50 % – There seems to be no way out of the dilemma

If the Anderson Vehicle is designed to stand the strain of a 15 pl atte Exide then the 1600 lbs of Chassis must

Carry 1170 lbs of lead
battery + 2 people in
total wt of 3070 lbs -

It will have 9408 watts
196 amp - at 100 watts per
ton mile it will go
61.2 miles of 70 watts per
ton mile it will go
87.6 miles -

With an Edison battery of
the same weight 43 A-8 cells
336 amp 52 volts giving 17472
watts. Therefore with 2
people + the same weight
total as with lead
The Edison will at 100
watts ton mile go 113.8
miles + on long change
135.5 miles - If it is 70 watts
ton mile it will go 162.6
miles + on long change
193.7 miles.
Or we could add 70 lbs
for an Extra seat on

Chassis, put in 4
persons & Substitute
40 A6 Cells, get same
weight, strength, & size wear
& obtain 12096 watts
which at 100 watts for
mile gives 78.8 miles on
short & 89.1 on long
Charge & at 70 watts
for mile - 127.3 miles -

Public Service
Telephone Mr Young
P S Young Comptroller
Room 912 Prudential
Bldg Newark

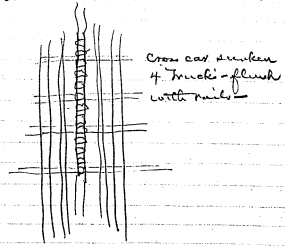
Highspeed level track
acceleration torque
120 lbs per ton
Braking 120 lb Ton
Duration of stops
15 Seconds
See Armstrong paper
XXII Elec Engrs page
92 — Curves

A recent subdivision for
500 KWH. Cost with land
$22,000 or $44 per KWH.
Interest & Depr. $2860 yr
Wages 3 men $8—
Labor cost $2820 $780 for
repairs - $400 supplies
Power factor only 30%
Whereas in SB Loco
80% or better —

No lightning protection
for SB Loco —

Electrifying figure
5% on investment —

At intermediate points
Colliers for training made
up & Cars cut out — to
save switching time &
expense — of Crews
Motor drivers decisions
to Cut out Cars from a
fresh train



Erie 5th Year train & loco run
night on board going usually
Cross river collie going rapidly
up + with spurs from 9th
ave Cleveland run train to
destination

Worst weather ice ele
1/14th of weight 1/5 in summer
Dry rails — 1/4th average.

Erie has 1333 locos
60 new ones each year
5% worn out

Double track RR Trolly
$10300, mile single track
$4800, Estimated
Up keep $200. mile per year

Old Elevated RR Repair
39 cents Car mile
new Electric 28 cents Car mile

Average run of RR loco
80 miles

Coal Cost 11% of Operating
Expense of a steam RR

Average passenger train
electrified 5.5 Cars

Electric average 60 tons
38 tons on drivers.

Wt passenger Cars
30 tons - average 27 tons

Including energy for heating
Cars Lighting 33 watts per
ton mile - at 30 miles per
hour at 40 miles 28 watt
hour per mile - all above

that at bus bar 17 watts,
at trolley 30 miles hour
20 watts hour ton mile — at 48
others say 66 watts —

20 mile run.
300 tons — acceleration
0.5 miles per hour per second
rate of braking 1.25
Coasting 40 seconds
Time stops 30 sec
including light, heating
3 months —

20 miles hour		100 KWH.
30	"	150 "
40	"	200
50	"	250

A maximum voltage drop of 10% on a trolley (track alone single phase system) will allow corresponding to a 25% @ 30% drop in whole line —

Efficiency on Indiana
Union traction Co -
56% from bus bar to motor on
car motor & gear loss
27% 42% net to track

acceleration very little
importance in suburban
railways where stops
infrequent averaging
1 in ½ miles —
above data Stillwell
paper Part I XXVI Elec Engr
jnnl Society —

Long Island steam train
average time of stops
0.49 average speed between
stations 26 miles hour
3 del trains ran 23 miles —
schedule time 56 minutes
~~approx~~ average spec
39.9 miles hr past 52 miles

grade level, Long Island City to Valley stream via far Rockaway

acceleration steam trains page 716 Vol XXIII Elect Engr Faculty above for 5 car train total cost 276 Tons

13 lbs per ton train for clim at 40 @ 45 miles hour

L Island RR limit their acceleration to 1 mile per hour per second

Present Trolley door equalizer—limited to 2 gaits full series & full multiple on these 2 points Cars must meet all conditions Motors must be geared for maximum speed which make them very inefficient

for slow speeds or
Wherever many stops
made — all kinds
devices tried all fail-
if geared 20 miles hour
then on acceleration at
certain rate takes 25%
more power than if geared
to 16 miles per hour
Motors may be easily
overloaded & burned
out -
Instead 2 motors of
4 used & can be reduced
somewhat (many of motor series) but complicates
seldom used —

Violent fluctuations
at Bossitt necessitate
storage Batteries

Many use 4 motors to get increased traction if they were geared loose could put current on gradual —

Think soft or Manganese steel wheels give best traction ~~Entel~~,

Trouble is slip on acceleration

No Electrolysis — no interference with Telephone —

of 100. Kilowatt hour Capacity
for complete power
@ Italian Cost

10% depen on where is it
night —

Think Regeneration for
braking is ok if coming
warranty Extra Complication

Old charge Elevated
before Electric pick on
(multiple Internal Sponsor)
was 46 28 Ton Locos
or 180 43 ft 15 Ton Cars

Funny How high speed autos
make such poor mileages over
~~them~~ a route + lowing cars
compared to Electric
Same thing on PLR I guess

Salesmen

	May 28		June	
	Spik	Reg	S	Reg
Chandler	10	0	5	0
Dawson	0	0	0	0
Doty	0	0	5	0
Fraser	0	0	438	65
Haugh	0	0	0	0
Kelly	0	10	10	0
Phillips	0	0	10	0
Sackett	10	0	10	0
Skelton	10	0	0	0
Slaughton	0	0	0	0
Gifl	0	0	0	0